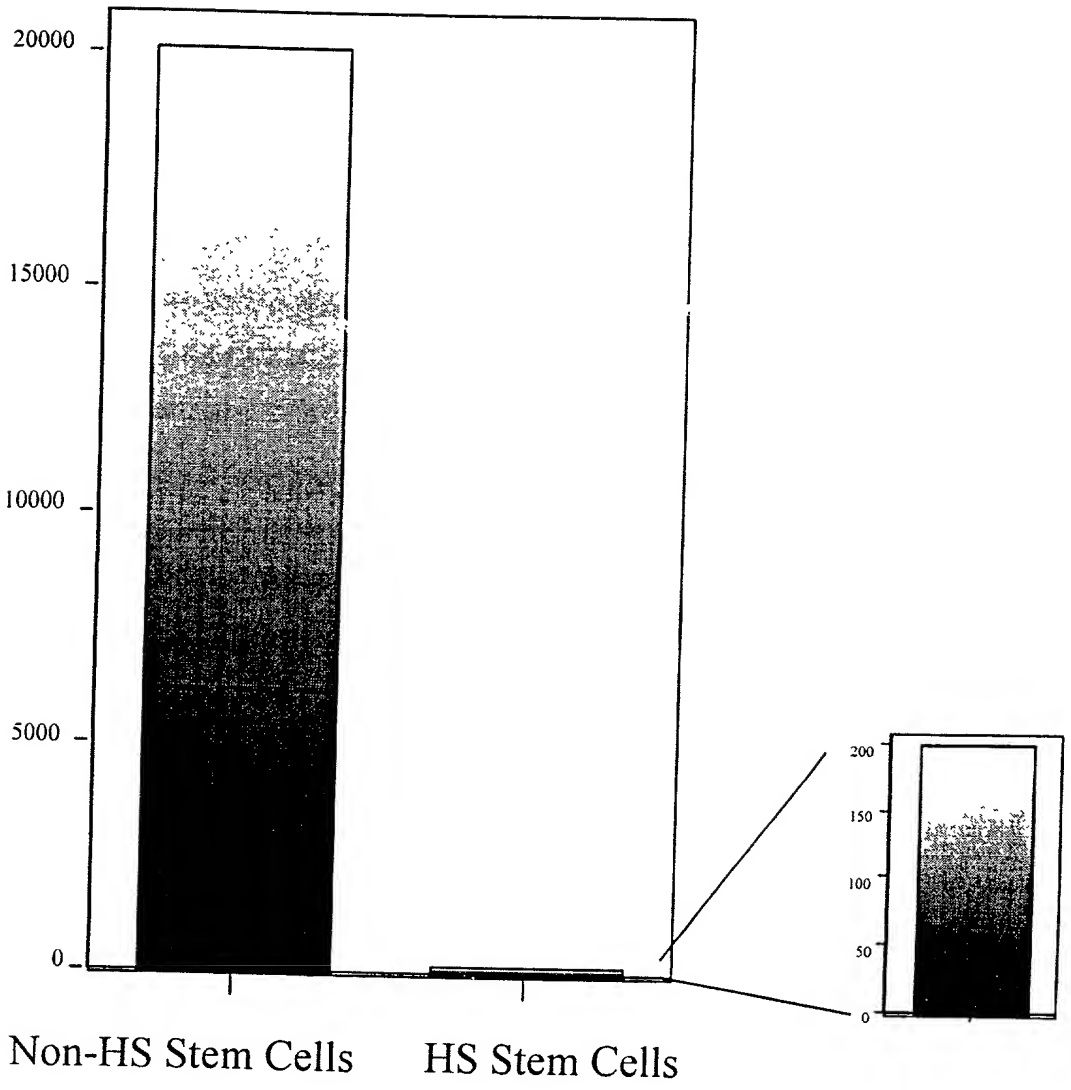
20000
15000
10000
5000
0
200
150
100
50
0
Non-HS Stem Cells
HS Stem Cells

Figure 1

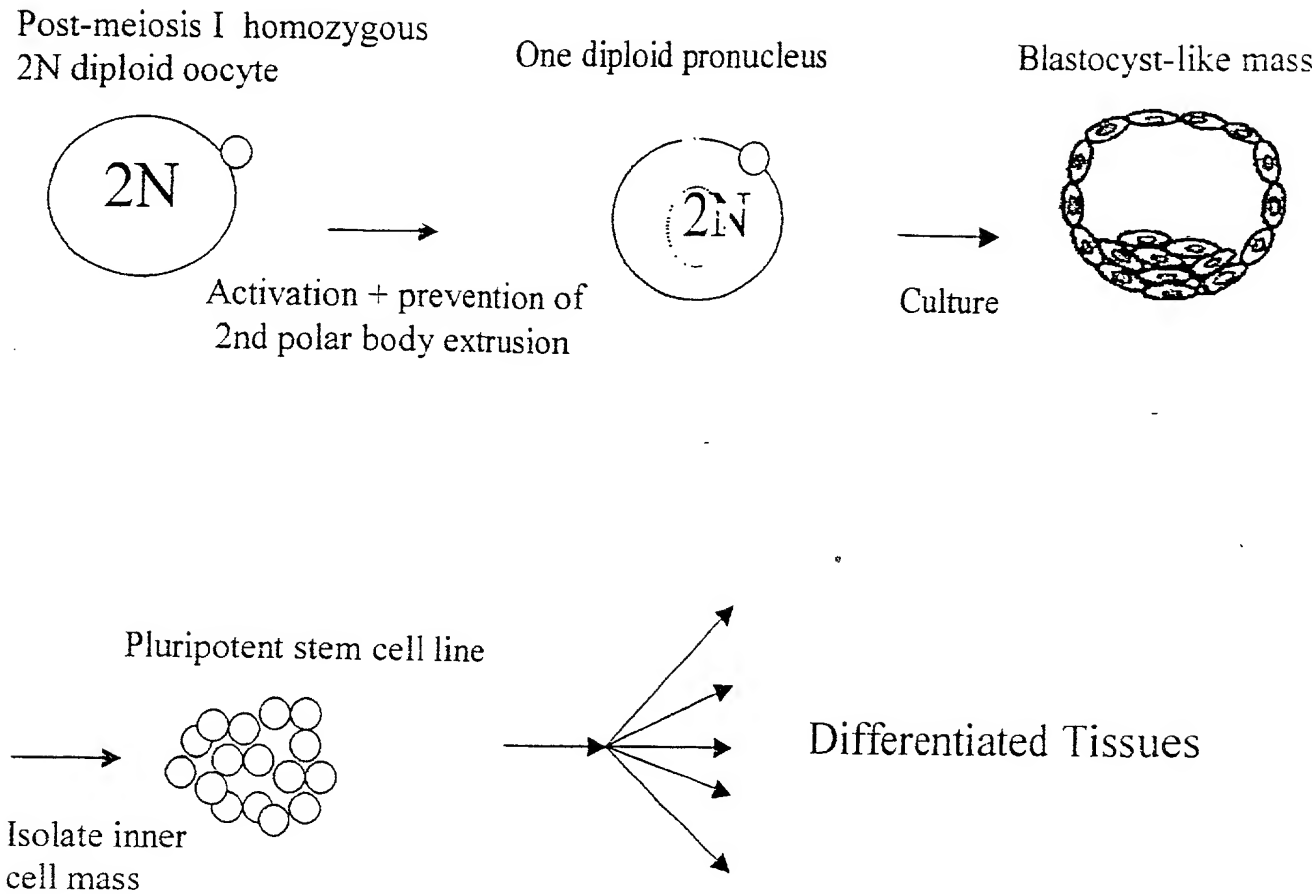
Post-meiosis I homozygous
2N diploid oocyte
2N
Activation + prevention of
2nd polar body extrusion
One diploid pronucleus
2N
Culture
Blastocyst-like mass
Pluripotent stem cell line
Isolate inner
cell mass
Differentiated Tissues

Figure 2

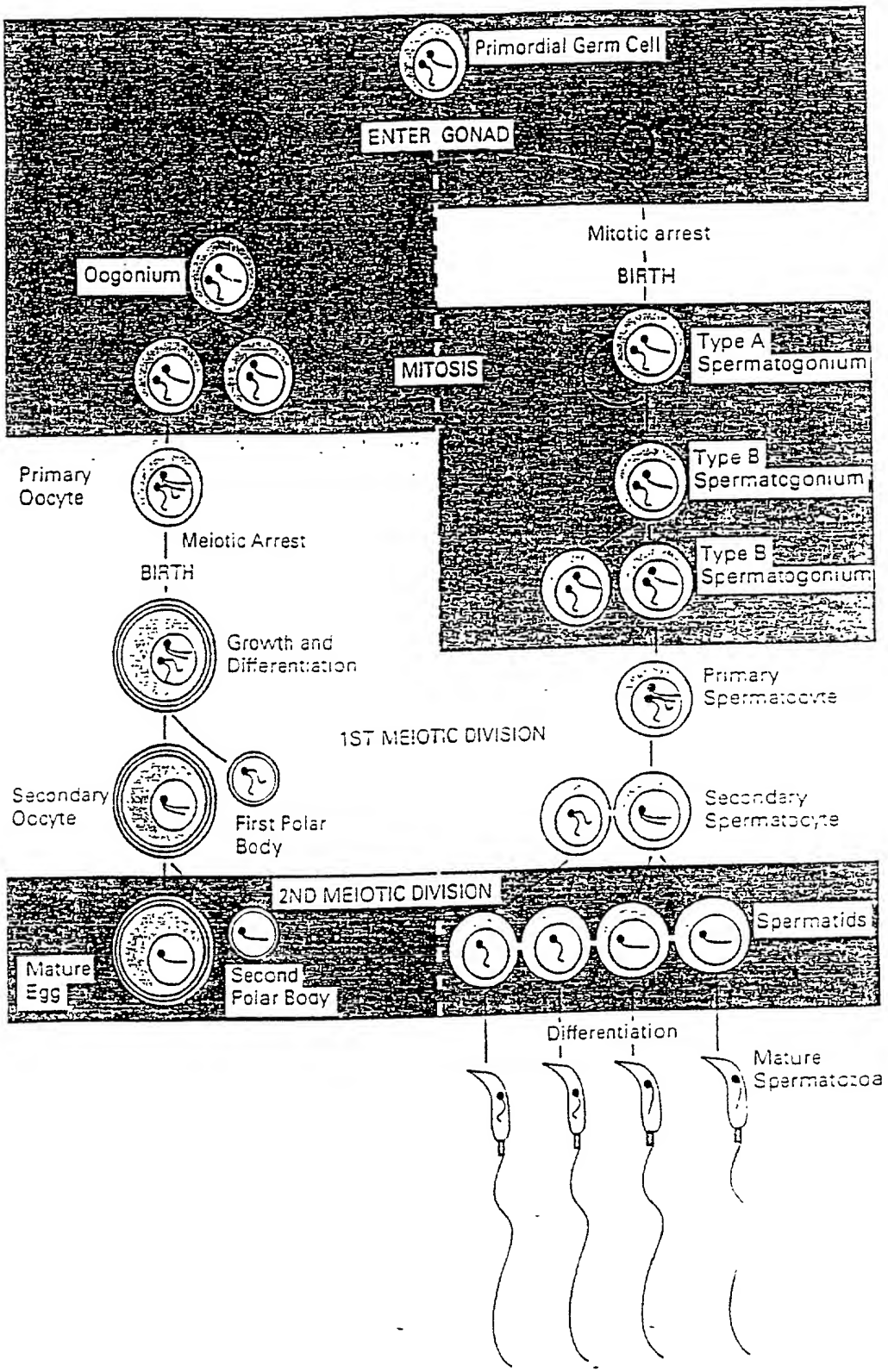
Primordial Germ Cell
ENTER GONAD
Mitotic arrest
BIRTH
Oogonium
MITOSIS
Type A Spermatogonium
Type B Spermatogonium
Type B Spermatogonium
Primary Oocyte
Meiotic Arrest
BIRTH
Growth and Differentiation
Primary Spermatocyte
1ST MEIOTIC DIVISION
Secondary Oocyte
First Polar Body
Secondary Spermatocyte
2ND MEIOTIC DIVISION
Spermatids
Mature Egg
Second Polar Body
Differentiation
Mature Spermatozoa

Figure 3

Serological Specificities of the HLA-A, -B, and -C Loci

A locus	B locus		C locus
A1[a]	B5	B50(21)[a]	Cw1[a]
A2[a]	B7[a]	B51(5)[a]	Cw2[a]
A203	B703	B5102	Cw3[a]
A210	B8[a]	B5103	Cw4[a]
A3[a]	B12	B52(5)[a]	Cw5[a]
A9	B13[a]	B53[a]	Cw6[a]
A10	B14[a]	B54(22)	Cw7[a]
A11[a]	B15	B55(22)[a]	Cw8[a]
A19	B16	B56(22)[a]	Cw9(w3)
A23(9)[a]	B17	B57(17)[a]	Cw10(w3)
A24(9)[a]	B18[a]	B58(17)[a]	
A2403	B21	B59	
A25(10)[a]	B22	B60(40)[a]	
A26(10)[a]	B27[a]	B61(40)[a]	
A28	B35[a]	B62(15)[a]	
A29(19)[a]	B37[a]	B63(15)[a]	
A30(19)[a]	B38(16)[a]	B64(14)[a]	
A31(19)[a]	B39(16)[a]	B65(14)[a]	
A32(19)[a]	B3901(16)	B67	
A33(19)[a]	B3902(16)	B70[a]	
A34(10)[a]	B40	B71(70)[a]	
A36	B4005	B72(70)[a]	
A43	B41[a]	B73	
A66	B42[a]	B75(15)	
A68(28)[a]	B44(12)[a]	B76(15)	
A69(28)[a]	B45(12)[a]	B77(15)	
A74(19)	B46	B7801	
	B47[a]	Bw4[a]	
	B48	Bw6[a]	
	B49(21)[a]		

[a] Serological specificities to be included in a screening panel.

Figure 4A

Officially Recognized HLA-DR and HLA-DQ Specificities 1992[3]

DR1	DQ1
DR103	DQ2
DR2	DQ3
DR3	DQ4
DR4	DQ5(1)
DR5	DQ6(1)
DR6	DQ7(3)
DR7	DQ8(3)
DR8	
DR9	
DR10	
DR11(5)	
DR12(5)	
DR13(6)	
DR14(6)	
DR1403	
DR1404	
DR15(2)	
DR16(2)	
DR17(3)	
DR18(3)	
DR51	
DR52	
DR53	

(N) = the broad HLA-DR or HLA-DQ specificity

Figure 4B

Restriction Endonucleases for Genotyping of DQA1, DQB1, DRB1, DRB3, DRB5, DPA1, and DPB1 Alleles

Allele	Antigen	Restriction endonucleases
DQA1		*ApaLI, HphI, BsaJI, FokI, MboII, MnlI*
DQB1	DQw1	*FokI, ApaI, HaeII, SfaNI, BssHII, HphI*
	DQw2,3,4	*FokI, BglI, SacI, AcyI, HpaII*
DRB1	DR1	*AvaII, PstI*
	DR2	*FokI, Cfr13I, HphI*
	DR3,5,6,8	*AvaII, FokI, KpnI, HaeII, Cfr13I, SfaNI, SacII, BsaJI, ApaI, HphI, RsaI*
	DR4	*SacII, AvaII, HinfI, HaeII, HphI, MnlI*
DRB3		*HinfI, KpnI, HphI*
DRB5		*SfaNI, Cfr13I*
DPA1		*AluI, AcyI, MboII*
DPB1		*Bsp12S6I, FokI, DdeI, BsaJI, BssHII, Cfr13I, RsaI, EcoNI, AvaII*

Figure 5

SSO Probes for HLA-DR Generic Typing

	Oligo seq 5' – 3'	AA	Specificity
L11	TTCAAACTTAAGCTGCCAC	9–14	DR1
D11	CTCATACTTATCCTGCTGC	9–14	DR2
N77	TCTGCAGTAGTTGTCCACC	75–80	DR3
H33	CTCTTGGTGATAGAAGTATC	29–35	DR4
E58	CCAGTACTCCTCATCAGGC	56–61	DR11
L37	AGCGCAGGAGCTCCTCCTG	34–39	DR12
C11	CTTATACTTACCCTGCCAC	9–14	DR7
L74	GTGTCCACCAGGGCCCGCC	71–77	DR8 (-1403)
Y26	CTGTGCAGATACCGCACCC	23–29	DR9
A11	CTCAAACTTAACCTCCTCC	9–14	DR10
E71	GGCCCGCTCGTCTTCCAGC	68–73	DR13 (1301, 1302, 1304) DR1 (0103) DR4 (0402, 0414) DR11 (1102, 03)
K71	CGGCCCGCTTGTCTTCCAG	68–73	DR13-HAG (1303)
H60	GTTCCAGTGCTCCGCAGCA	57–62	DR14 (1401, 04, 07)
N37	AGCGCACGTTCTCCTCCTG	34–39	DR3 DR13 (1301, 02, 04, 06) DR14 (1402, 03, 06)
D37	GAAGCGCAAGTCCTCCTCT	34–40	DR2 (DRB5*0101)
AV86	GCTCTCCACAGCCCCGTAG	83–88	DR2 (DRB5*02) DR1 (0102) DR12

SSO Probes for the Analysis of DRB1, DRB3, DRB5 Subtypes

	Oligo seq 5' – 3'	AA	Specificity
G13	ACACTCACCCGTAGAGTAC	9–14	0801–0805, 1105 1201, 1202 1404
H30-2	ATAGAAGTGTCTGTCCAGG	27–32	1503
N37	AGCGCACGTTCTCCTCCTC	34–39	0301, 402, 1301, 1302, 1305 1306, 1402, 1403 1406
S37	AGCGCACGGACTCCTCTTG	34–39	0406
S57	GCCTAGCGCCGAGTACTG	56–61	0405, 0409–0412, 0801, 0803, 0805, 1303, 1
H60	GTTCCAGTGCTCCGCAGCA	57–62	1401, 1404, 1407
F67	CTTCCAGGAAGTCCTTCTG	64–69	1601, 1101, 1103–1105, 1202, 1305
Ic7	CTTCCAGGATGTCCTTCTG	64–69	0803, 1102, 1201, 1301–1304, 1306, 0412
I67-2	ACATCCTGGAAGACGAGC	66–71	0103, 0402, 0414, 1102, 1301, 1302, 1304
E71	GGCCCGCTCGTCTTCCAGG	68–73	0103, 0402, 0414, 1102, 1103 1301, 1302, 1304
K71	CGGCCCGCTTGTCTTCCAG	68–73	1303
QK71	CGGCCCGCTTCTGCTCGAC	68–73	0401, 0409, 0413
QR71	CCGCGGCCCGCCTCTGCTC	69–74	0404, 0405, 0408, 0410–0411
QR71-2	CGGCCCGCCTCTGCTCCAG	68–73	0101, 0102, 0403–0408, 0 0411, 1402, 1
R71	GGCCCGCCTGTCTTCCAGG	68–73	1101, 1104, 1105, 130 0801–0805, 1403, 0412
R71-2	CCGCGGCGCGCCTGTCTTC	69–74	1601, 1602, DRB5*01 0102
RR71	AGCGGAGGCGGGCCGAGG	69–74	1401, 1404, 1405, 140 (DRB*0101)
E74	GTGTCCACCTCGGCCCGCC	71–77	0403, 0406, 0407, 0411, 1401, 1404, 1405, 1407
L74	GTGTCCACCAGGGCCCGCC	71–77	0801–0805, 1403, 0412
V86	AACTACGGGGTTGTGGAG	82–87	Val86
G86	AACTACGGGGTTGGTGAG	82–87	Gly86
AV86	GCTCTCCACAGCCCCGTAG	83–88	0102, 1201, 1202 DRB5*02

Figure 6

Locus	5′ Primer sequence	3′ Primer sequence
D6S276	5-tcaatcaaatcatccccagaag	5-ccttctttgcagactgtcacc
D6S105	5-gggattacaggcaggagccac	5-gaaggagaattgtaattccg
MOGCA	5-gaaatgtgagaatanaggaga	5-gataaaaggggaactactaca
D6S265	5-agtcaccctactgtgctatc	5-atcgaggtaaacagcagaaag
MIB	5-gcttcacccgatcagtagaagac	5-gcatggtgtcagagatagtcaggtc
D6S273	5-ggagaagttgagtatttctgc	5-accaaaacttcaaattttcgg
DQCARII	5 gcactatcattaaatttgctttccacagtac	5-tgattcataaggcaagaatccagcatattgg
DQCAR	5-gaaacatatattaacagagacagacaaa	5-catttctcttccttatcacttcata
G51152	5-ggtaaaattccctgactggcc	5-gacagctcttcttaacctgc
TAP1CA	5-gctttgatctccccccte	5-ggacaatattttgctcctgagg
RING3CA	5-tgcttatagggagactaccg	5-gaggtaatgtcacaggatggg
D6S291	5-ggcattcaggcatgcctggc	5-ggggatgacgaattattcactaact

Figure 7

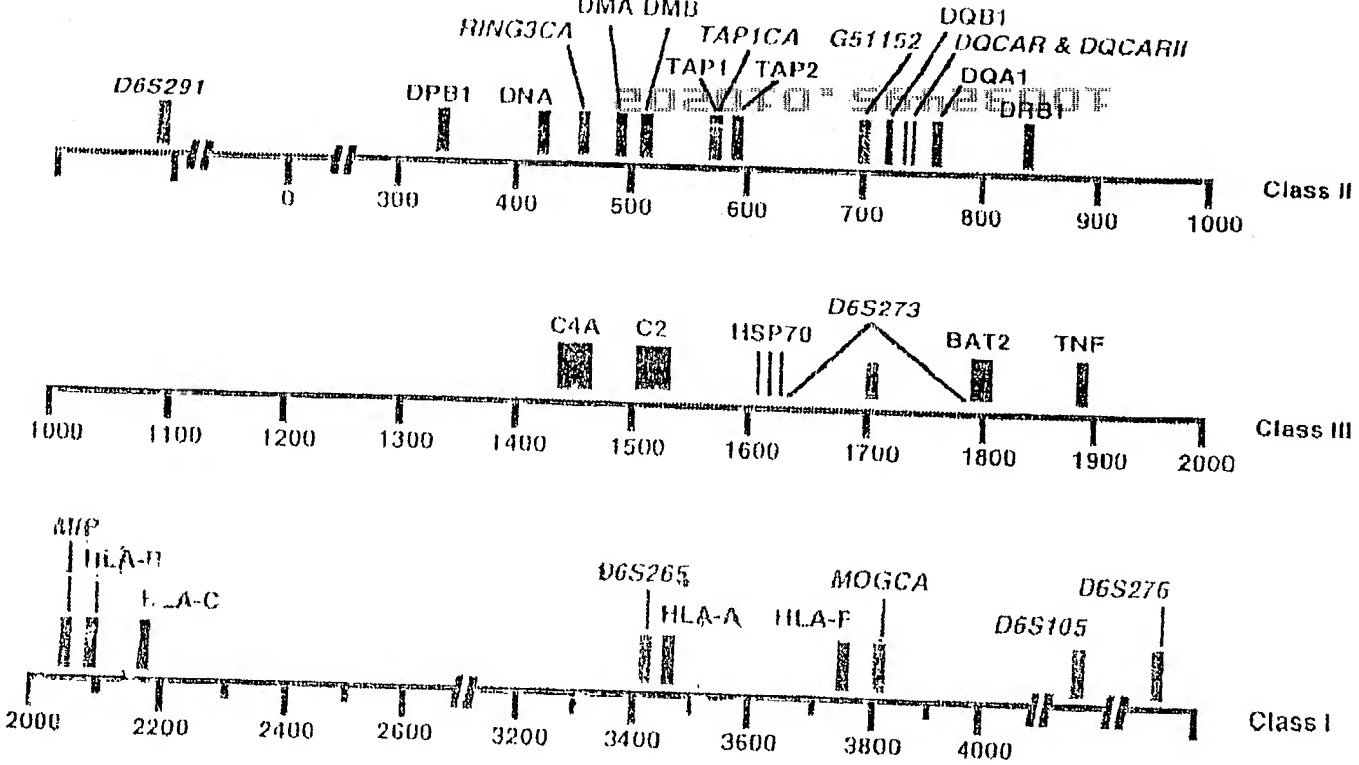
RING3CA
DMA DMB
TAP1CA
G51152
DQB1
DOCAR & DQCARII
TAP1
TAP2
DQA1
D6S291
DPB1
DNA
DRB1
0
300
400
500
600
700
800
900
1000
Class II
C4A
C2
HSP70
D6S273
BAT2
TNF
1000
1100
1200
1300
1400
1500
1600
1700
1800
1900
2000
Class III
MIB
HLA-B
HLA-C
D6S265
HLA-A
HLA-F
MOGCA
D6S105
D6S276
2000
2200
2400
2600
3200
3400
3600
3800
4000
Class I

Figure 8

Figure 9A.

Figure 9B.

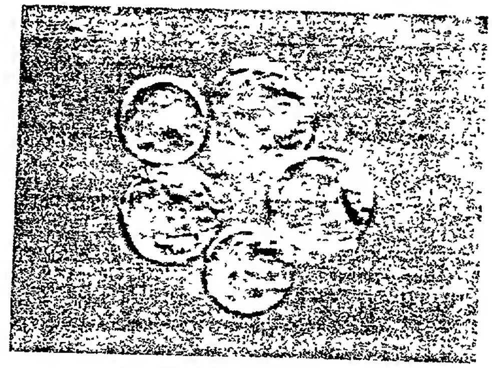

Figure 9C.

Figure 9D.

Figure 9E.

1 2 3

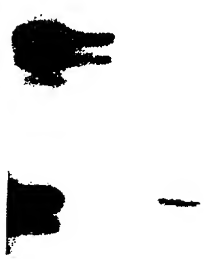

Figure 9F.

1 2 3

Figure 10A

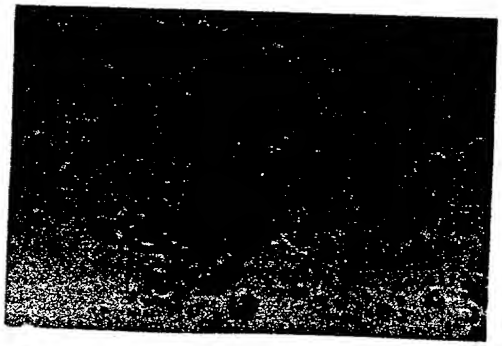

Figure 10B

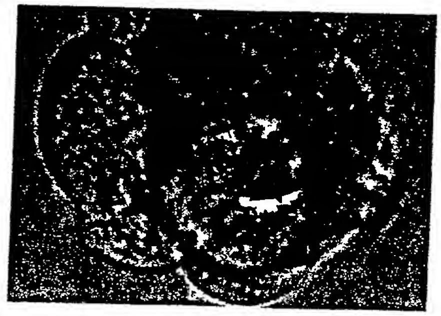

Figure 10C

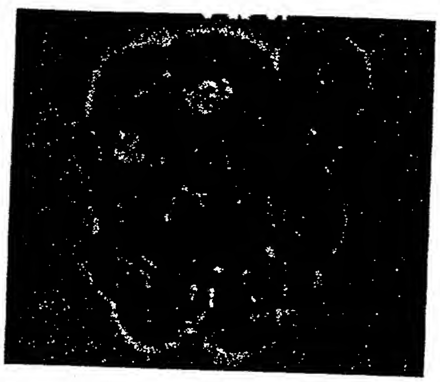

Figure 10D

PCR Primers for Amplification of the DQA1, DQB1, DRB1, DRB3, DRB5, DPA1, and DPB1 Genes

Gene		Primers		Sequences (5′ to 3′)		Den.	Ann.	Ext.
DQA1		5′Primer	GH26	GTGCTGCAGGTGTAAACTTGTACCAG	(242 bp)	94°C	62°C	72°C
		3′Primer	GH27	CACGGATCCGGTAGCAGCGGTAGAGTTG				
DQB1	For DQw1	5′Primer	GH28NL	GCATGTGCTACTTCACCAACG	(241 bp)	94°C	55°C	72°C
		3′Primer	QB202	CACCTGCAGATCCCGCGGTACGCCACCTC				
	For DQw2	5′Primer	GH28NL	GCATGTGCTACTTCACCAACG	(237 bp)	94°C	55°C	72°C
	DQw3							
	DQw4	3′Primer	QB204	CACCTGCAGTGCGGAGCTCCAACTGGTA				
DRB1	For DR2	5′Primer	5′R2	TTCCTGTGGCAGCCTAAGAGG	(261 bp)	94°C	60°C	72°C
	For DR4	5′Primer	5′R4	GTTTCTTGGAGCAGGTTAAAC	(263 bp)	94°C	60°C	72°C
	For DR9	5′Primer	5′R9-1	GAAGCAGGATAAGTTTGAGTG	(256 bp)	94°C	55°C	72°C
	For DR1	5′Primer	5′R1	GGTTGCTGGAAAGATGCATCT	(206 bp)	94°C	55°C	72°C
	For DR7	5′Primer	5′R7	AGTTCCTGGAAAGACTCTTCT	(206 bp)	94°C	60°C	72°C
	For DR10	5′Primer	5′R10	GGTTGCTGGAAAGACGCGTCC	(206 bp)	94°C	60°C	72°C
	For DR3	5′Primer	5′R3568	ACGTTTCTTGGAGTACTCTACG	(265 bp)	94°C	60°C	72°C
	DR5							
	DR6							
	DR8							
		3′Primer	3′R (common for DRB1)	CCGCTGCACTGTGAAGCTCT				
DRB3		5′Primer	DRBAMP-52	CCCAGCACGTTTCTTGGAGCT	(271 bp)	94°C	60°C	72°C
		3′Primer	3′R	CCGCTGCACTGTGAAGCTCT				
DRB5		5′Primer	5′DRB5	CTTGCAGCAGGATAAGTAT	(259 bp)	94°C	60°C	72°C
		3′Primer	3′R	CCGCTGCACTGTGAAGCTCT				
DPA1	For 3rd exon	5′Primer	PL	GGAAGCTTGATCCCCCTGAGGTGACCG	(288 bp)	92°C	58°C	72°C
		3′Primer	PR	GGGGATCCCCAGTGCTTGAGGAGCGGC				
	For TM exon	5′Primer	PLTM	GGAAGCTTGAGGCCCAAGAGCCAATCCA				
		3′Primer	PRTM	GGGGATCCGCCAGAACGCAGAGACTT		(161 bp)		
DPB1		5′Primer	DPB101N	GTGAAGCTTTCCCCGCAGAGAATTAC	(299 bp)	94°C	62°C	72°C
		3′Primer	DPB201	CACCTGCAGTCACTCACCTCGGCGCTG				

Note: Den.. Denature, Ann.: annealing, Ext.: extention.

Figure 11